Genetic polymorphisms responsible or associated with altered expression of cytochrome P450 CYP3A5 enzyme are described. Single nucleotide polymorphisms are provided. Methods for identifying subjects having a low or high drug metabolizing phenotype associated with CYP3A5 expression are provided. Assays, kits and methods for determining and assaying the CYP3A5 genotype and phenotype of individual patients are disclosed. Oligonucleotide probes and primers for use in the assays, kits and methods are described. Assays and methods for determining and evaluating an individual's metabolism of drugs and therapeutic agents, the potential for drug interactions, and thereby toxicity and effectiveness of certain drugs and treatment modalities, are provided.